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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Fred Oliveira et al.
Serial No: 09/474,607
Confirmation. No.: 2467
Filed: December 29, 1999
For: METHOD AND APPARATUS FOR USING MULTIPLE PATHS
FOR PROCESSING OUT OF BAND COMMANDS

Examiner: Pollack, Melvin H.
Art Unit: 2142

CERTIFICATE OF MAILING UNDER 37 C.F.R. §1.8(a)

The undersigned hereby certifies that this document is being placed in the United States mail with first-class postage attached, addressed to MAIL STOP AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the 1st day of July, 2003.

Richard F. Giunta, Reg. No. : 36,149

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Technology Center 2100

Transmitted herewith are the following documents:

- ☒ Response to Office Action
- ☒ Return Receipt Postcard

If the enclosed papers are considered incomplete, the Mail Room and/or the Application Branch is respectfully requested to contact the undersigned at (617) 720-3500, Boston, Massachusetts.

A check is not enclosed. If a fee is required, the Commissioner is hereby authorized to charge Deposit Account No. 23/2825. A duplicate of this sheet is enclosed.

Respectfully submitted,
Fred Oliveira et al., Applicant

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Docket No. E00295.70136.US
Date: 07/01/03
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RESPONSE TO FINAL OFFICE ACTION

Sir:

In response to the Final Office Action dated May 22, 2003, Applicants respectfully request reconsideration. To further the prosecution of the present application, each of the rejections set forth in the Office Action is addressed below. The application is believed to be in condition for allowance.

Initially, Applicants note that the critical issue in connection with the rejection of each of the claims is that the prior art of record does not teach or suggest the processing of out of band control commands in the manner recited in the claim. In fact, none of the prior art references of record relate at all to out of band control commands, when that term is properly interpreted as used in the present application.

In ¶6, the final Office Action asserts that the features upon which Applicants have relied in their arguments (i.e., out of band commands) "are not recited in the rejected claim(s)." (Office

Action, page 3). The Examiner's position in this respect is not clear, as each of the claims clearly recites the processing of an out of band control command. Therefore, if the rejections are not withdrawn, it is respectfully requested that some justification for this position be provided.

On a related point, Applicants note that the term "out of band control command" is defined in the specification as referring:

To any control command outside of the normal read/write path of the system, which can include commands that implement control functions, as well as those that perform read or write operations outside of the normal read/write path. (specification, page 33, lines 3-6).

In view of the fact that Applicants have specifically defined the term "out of band control command" in the specification, the defined meaning must be given to the term as used in the claims. (see MPEP §2111.01). It is respectfully asserted that the Office Action has failed to give the appropriate meaning to this term as defined in the specification.

For example, at ¶3 of the Office Action, it is asserted that Grun teaches that a path selection technique could be employed wherein certain commands or data packets would be separated to be transmitted over different physical paths, and that this "would make them out of band commands as per the definition." Applicants respectfully disagree that Grun provides any such teaching, as will be addressed in more detail below. Transmitting different commands over different physical paths does not render one group of the commands an out of band control command that is processed out of the normal read/write path, as the normal read/write path of the system can include multiple physical connections between a host and a storage system.

Rejection Under §102 in View of Lambrecht

Initially, Applicants respectfully assert that the record is unclear as to whether the rejection of any of the claims under §102 as being anticipated by Lambrecht has been maintained in the final Office Action. Lambrecht is not discussed under either of the sections entitled "Claim Rejections" (beginning at pages 4 and 5) but is merely mentioned in ¶8 at page 3 of the Office Action. In this respect, Applicants appreciate the Examiner calling to our attention that the prior response did not specifically discuss the rejection in view of Lambrecht. This omission was unintentional, and it is believed that the arguments presented demonstrated how all of the claims clearly distinguish over Lambrecht.

If the Examiner does not believe that the application is in allowable condition in view of this response, he is respectfully requested to clarify for the record whether the rejection under §102 over Lambrecht is being maintained.

In ¶18-19 of the prior Office Action, claim 1 was rejected under §102 as being anticipated by Lambrecht, with the Office Action asserting that an out of band control command could be sent down a bus 230 while data could be transferred down bus 232. If this rejection has been maintained, it is respectfully traversed.

Lambrecht is entirely silent with respect the processing of out of band commands, and simply refers to the processing of data through a normal read/write path. The normal read/write path can include multiple buses 230 or 232. Lambrecht teaches nothing with respect to the processing of out of band control commands.

In addition, claim 1 specifically refers to the out of band control command as identifying, from among multiple paths, a target path for transmission of the command, and the selecting of a path using a selection criteria that enables the selected path to be other than that identified by the command. Lambrecht is entirely silent with respect to this limitation in claim 1, and the Office Action does not even purport to explain where this feature of claim 1 is shown in Lambrecht.

In view of the foregoing, claim 1 patentable distinguishes over Lambrecht, such that any rejection of claim 1 under §102 as being anticipated over Lambrecht should be withdrawn.

Rejections Under §102 Over Grun

In ¶10 of the Office Action, claims 1-3 and 7 are rejected under 35 U.S.C. §102 as being anticipated by Grun. This rejection is respectfully traversed.

As discussed in Applicants' prior response, which is incorporated herein by reference, Grun simply does not teach or suggest any processing of out of band control commands.

In ¶12, the Office Action asserts that "Fig. 1 of Grun is quite similar to Fig. 12 and 16 of the application." With respect to Fig. 12, any similarities the Examiner appears to be focusing upon relate to the fact that there is shown a multi-path system with multiple physical paths between a host computer and a storage system. Numerous such systems exist, and teach nothing with respect to the claimed invention. With respect to Fig. 16, that figure conceptually illustrates the processing of out of band control commands over a path outside of the normal read/write

path. It does not teach the use of different physical paths between two components in a system. Thus, Fig. 1 of Grun is not similar in any meaningful respect to Fig. 16.

To support the rejection, the Office Action asserts that Grun teaches that the determination of which physical path to use is dependent upon a descriptor, and that “It is **anticipated** that the descriptors can be chosen in such a way as to separate certain commands or data packets, which would make them out of band commands as per the definition.” (Office Action, ¶7). In support, the Examiner cites col. 3, lines 13-28 of Grun. Applicants have reviewed this section of Grun, and it is entirely silent with respect to any technique for selecting a particular path for the transmission of data.

In addition, the above-quoted conclusion is objectionable in multiple respects. First, it is inappropriate for the Examiner to read into the reference disclosure that is not there. Thus, it is inappropriate for the Examiner to “anticipate” that the reference might be used in certain ways that could support a rejection, unless the Examiner can provide rationale or evidence that the reference inherently discloses this feature. To establish an inherency rejection, the Examiner must demonstrate that the reference necessarily works in the manner alleged, as mere possibilities do not suffice. M.P.E.P. §2112. That burden cannot be sustained here.

Second, even if Grun taught that certain types of commands or data packets might preferably be used for transmission over certain physical paths, each of those physical paths would still comprise a normal read/write path for the system, and the use of different physical paths for some commands would not render those commands out of band control commands.

Third, claim 1 specifically recites the processing of a command that identifies a target path for its transmission, and then the selecting of a path for transmission based upon selection criteria that enables the selected path to be other than that identified by the command. Grun is entirely silent with respect to this feature of claim 1. In fact, the premise on which the rejection is based - that a descriptor can be chosen to segregate commands between various paths - teaches away from this feature by suggesting that a command will be sent over the path identified for it to achieve the desired segregation.

Fourth, Grun specifically teaches away from the separation of certain commands or data packets to be transmitted over specific physical paths. Specifically, the disclosure of Grun seeks:

to provide the driver 14 or any other initiator in host 10 the illusion of an arbitrarily large bandwidth. Further, transport 50 combines multiple physical channels into one large logical channel without

imposing any increased overhead on I/O controller 40 or processor 12. (col. 4, lines 40-45).

The type of scheme that the Examiner "anticipates" might be used in Grun would require that the host computer differentiate between various types of commands and then treat each of the physical channels separately. This is against the specific teachings of Grun, which are that the use of multiple physical channels is transparent to the host, such that the multiple physical channels are used only to provide increased bandwidth, and that they collectively look to the host as one large virtual channel, such that from the host's perspective, there is only one channel over which to send the commands and data, such that the host would not be arranged to separate certain commands for transmission over different physical channels that are essentially transparent to it.

For all of the foregoing reasons, the rejection of claim 1 under 35 U.S.C. §102 as being anticipated by Grun is improper, and should be withdrawn.

Claims 2-7 depend from claim 1 and are patentable for at least the same reasons.

Claims 8-14

Claim 8 is directed to a computer readable medium encoded with a program that, when executed, performs a method substantially similar to claim 1. Therefore, for the reasons discussed above in connection with claim 1, it is respectfully asserted that claim 8 patentably distinguishes over the prior art of record, such that the rejection of claim 8 (as well as claims 9-14 depending therefrom) should be withdrawn.

Claims 15-22

Independent claim 15 is directed to a host computer for use in a multi-path system. The host computer comprises at least one processor to execute an out of band control command, and at least one controller that selects a path for transmitting the out of band control command based upon a selection criteria that enables the selected path to be other than the target path identified by the out of band control command.

As discussed above in connection with claim 1, the prior art of record fails to teach a host computer that executes an out of band control command, let alone a host comprising a controller that selects a path for transmitting the out of band control command using a selection